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Arnold Schwarzenegger
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March 22, 2004

Mr. Dave Stalters
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APPROVAL OF RCRA FACILITY INVESTIGATION (RFI) REPORT FOR SAN MIGUEL ISLAND AID TO NAVIGATION (ATON) SITE RELATING TO DISPOSAL OF BATTERIES OR BATTERY CONSTITUENTS, UNITED STATES COAST GUARD (USCG)

Dear Mr. Stalters:

The Department of Toxic Substances Control (DTSC) has reviewed the subject document dated November 24, 2003, prepared by CDM Federal Programs Corp. in response to DTSC's April 23, 2003 comments on the draft document dated February 6, 2003. The RFI report presents the results of sampling, conducted in November 2002, to determine releases from the former ATON unit on the San Miguel Island. A total of 44 soil samples were collected from the ATON area and radii, erosion channel from ATON to beach, beach area, and background area. DTSC staff provided field oversight during the investigation which was conducted in accordance with the final RFI Workplan dated September 27, 2002 and approved by DTSC on October 18, 2002. The report recommends No Further Action (NFA) based on the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) prepared for the ATON site.

DTSC is satisfied that its comments in the April 23, 2003 letter have been adequately addressed in the final document and we hereby approve it. We want to point out that the previous version of the RFI report did not have a section for the HHRA and ERA and we were unable to comment on the risk assessment portion of the report. Dr. Brian Davis of our Human and Ecological Risk Division has prepared the enclosed comments and suggestions to improve risk assessment for future ATON sites.

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March 22, 2004
Page 3

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Mr. Dave Stalters
March 22, 2004
Page 2

DTSC looks forward to working with the USCG to expedite the investigation and cleanup of Coast Guard ATON sites in California if needed. If you have any questions, please call Mr. Tayseer Mahmoud at (714) 484-5419.

Sincerely,



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MEMORANDUM

TO: Tayseer Mahmoud
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FROM: Brian K. Davis, Ph.D. *Brian K. Davis*
Staff Toxicologist
Human and Ecological Risk Division

DATE: March 15, 2004

SUBJECT: RCRA Facility Investigation Report for San Miguel Island
PCA: 22120 Site: 520031-00 MPC: 16 PER

BACKGROUND

Document Reviewed: RCRA Facility Investigation Report. San Miguel Island Aid to Navigation Site. Santa Barbara Channel, California. Prepared for U.S. Coast Guard Civil Engineering Unit, Oakland. Prepared by CDM Federal Programs Corp. Dated November 24, 2003.

Documents Previously Reviewed: We reviewed the February 6, 2003 RCRA Facility Investigation Report in a memorandum dated April 21, 2003. We reviewed the Ecological and Human Health Risk Assessment Work Plan and Preliminary Evaluation for the San Miguel Island Aid to Navigation in a memorandum dated December 7, 2001. We reviewed Revisions to Section 3 of the Ecological and Human Health Risk Assessment Work Plan and Preliminary Evaluation in a memorandum dated May 28, 2002. We reviewed the Sampling and Analysis Plan for the San Miguel Island Aid to Navigation in a memorandum dated July 2, 2002. We reviewed the Final RCRA Facility Investigation Workplan/Sampling and Analysis Plan for the San Miguel Island Aid to Navigation in a memorandum dated October 15, 2002.

Coast Guard Aids to Navigation (ATONs) - based on information from U.S. Coast Guard documents: More than 600 active and 400 inactive Aids to Navigation (ATON)

sites have been identified in California. Discarded batteries have been found at both terrestrial and aquatic sites. The focus of investigations has been the Channel Islands, located off the coast of southern California. There are eleven ATON sites on six of the Channel Islands. San Miguel Island is one of five islands comprising the Channel Islands National Park. The other four islands are Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara. San Miguel Island is 9325 acres. It has the only marine mammal rookery in the world inhabited by six species of seals and sea lions. The San Miguel Island ATON site is on a plateau 375 feet above sea level, near Crook Point. Battery debris was found over the edge of the plateau below the ATON site. In 1997, the Coast Guard removed 2100 pounds of battery debris and eight whole batteries (although not specified, it is assumed that these were ATON batteries) from the ATON site. A deep erosion channel or arroyo leads from the ATON site to the beach below. This arroyo could provide a mechanism for transporting contaminants from the ATON site to the beach and the mammal rookeries.

Scope of the Review: The document was reviewed for scientific content related to the data evaluation and risk assessment. We assume that regional personnel have evaluated the analytical chemistry methods, and associated quality assurance/quality control (QA/QC) procedures.

GENERAL COMMENTS ON SAMPLE DATA

1. SAMPLE POPULATIONS.

- A. Soil samples were taken in four general areas – a selected background area, the ATON area, the main arroyo, the cross channel, and the beach (Section 3.3.1).
- B. Inspection of the concentrations of inorganic chemicals clearly shows the pattern of ATON area > main arroyo > background > cross channel > beach (Table 3-3). There are few exceptions to this pattern.
- C. Among the main arroyo samples, there is a clear pattern of decreasing chemical concentrations with increasing distance from the ATON area.
- D. These patterns are consistent with the ATON area as a source of contamination. It is somewhat surprising that the pattern is followed for all of the inorganic chemicals, with the possible exception of those which were infrequently detected.
- E. The patterns were not taken into account in the treatment of the data in this document. The document doesn't address the question of the validity of the background samples (General Comment 2). The document treats all samples from the ATON area, the main arroyo, the cross channel, and the beach as one population, though they are obviously not (General Comment 3).

2. BACKGROUND SAMPLES. We commented previously (Department of Toxic Substances Control {DTSC}, 2003) that site concentrations of all nine inorganic constituents showed a strong tendency to exceed the maximum background concentration. We continue to believe that the background locations may not be representative.
3. STATISTICAL ANALYSIS.
 - A. Pooling all "site" data (the ATON area, the main arroyo, the cross channel, and the beach) is clearly unwarranted. It is evident from Table 3-3 that there are different populations (General Comment 1). A statistical test for homogeneity would surely support this conclusion. The statement (Section 3.6) that "*The UCL is a conservative estimate of the average chemical concentration in an environmental medium.*" Is not true in this instance, because the higher concentrations found in the ATON area have been diluted by the very low concentrations in the cross channel and beach areas.
 - B. Section 3.7 asserts that "*For example, zinc data were log-normally distributed suggesting samples drawn from a single population...*" Inspection of the sample data for zinc clearly demonstrates that this statement is incorrect. The seven samples in the ATON area ranged from 29.7 to 72.9 mg/kg; the ten samples in the main arroyo ranged from 7.6 to 109 mg/kg; the three samples in the cross channel ranged from 5.4 to 7.7 mg/kg; the three samples in the beach area ranged from 2.9 to 3.6 mg/kg. Furthermore, there is a clear geographical pattern among the main arroyo samples, with the five highest zinc concentrations at the higher elevations, near the ATON area and the six lowest zinc concentrations at the lower elevations, farthest from the ATON area.
 - C. It is obvious from Table 3-3 that the samples from the ATON area and the main arroyo exceed the background concentrations and the samples from the cross channel and the beach are less than the background concentrations. Section 3.7 reports that the Wilcoxon Rank Sum test showed that the site data and background data were from different populations. Since the "site" data were pooled from the four areas, the results of the Wilcoxon Rank Sum test were dependent on the relative number of samples from each area. Since more samples were taken in the ATON area and the main arroyo, the test presumably showed that the pooled "site" concentrations were higher than the background concentrations. If a greater number of samples had been taken in the cross channel and the beach, the Wilcoxon Rank Sum test would have shown that the background concentrations were higher than the pooled "site" concentrations.
 - D. The qualitative descriptions of the statistics in Section 3.7 would normally need to be supplemented with the actual results. However, as discussed above, the statistical analysis in this case is less informative than simple inspection of the data.

4. EXPOSURE POINT CONCENTRATIONS.

- A. The "site" data probably consist of at least four different populations. This heterogeneity mitigates against pooling the data for statistical analysis (General Comment 3). Neither the 95% upper confidence limit on the arithmetic mean nor any other statistic based on the pooled data is a valid estimate for exposure point concentration. This applies primarily to the ecological risk assessment. The human health risk assessment used maximum concentrations for screening, but did invoke the 95% upper confidence limit on the arithmetic mean in the uncertainty discussion (Section 5.7.1.1).
- B. Statistical analysis could be based on the ATON area alone, or perhaps the ATON area and samples taken in the upper portion of the main arroyo. We do not recommend such an analysis. We strongly recommend that the treatment of sample data be more carefully evaluated in future documents.

GENERAL COMMENTS ON ECOLOGICAL RISK ASSESSMENT

5. SCREENING EVALUATION.

- A. Section 4.2.2 discusses several sets of screening benchmarks. These are summarized in Table 4-1. This is useful information and we understand that some of the sets are provided only for comparison. A justification should be provided for the selection of the sets of screening benchmarks, used in the risk assessment (Section 4.6.1).
- B. For some of the benchmark sets (Beyer, U.S. EPA Region 5), it is unclear what organisms were considered. This would influence the utility of the benchmarks.
- C. We recommend using the U.S. EPA Soil Screening Levels for plants and soil invertebrates. However, because only low levels of possible contaminants were found, we do not recommend revisions to this analysis.

6. DERMAL CONTACT AND INHALATION.

- A. We do not accept the argument (Section 4.3.1) that fur, feathers, or scales necessarily act as a barrier to limit soil contact. These skin coverings can also serve to enhance soil contact, particularly for animals that dust bathe. Dermal contact and inhalation can be significant exposure routes for some ecological receptors and some chemicals.
- B. Burrowing animals are of particular concern with respect to dermal contact and inhalation. Section 3.9 describes evidence of burrowing rodents at the San Miguel ATON site.

- C. However, the facts that the potential contaminants are inorganic chemicals and that the area is small mitigate against the significance of these exposure routes. Therefore, we concur with the decision not to evaluate them in this risk assessment.

7. FOOD WEB EXPOSURE.

- A. The equation for dose (page 4-20) needs further explanation. The expression within the first set of parentheses presumably represents the summation of as many prey items as is appropriate, but this is not obvious. This same expression includes the term "SSF" which presumably should be "SFF".
- B. The terms "*NIR_{ww}*" and "*NIR_{dw}*" need further explanation.
- C. We did not check the calculations of the dose estimates or the hazard quotients (Table 4-5). The first reason is that we do not accept the exposure point concentrations (General Comment 4). The second reason is the legibility of the exposure parameter tables (Specific Comment 15).

8. BIOACCUMULATION FACTORS. Bioaccumulation factors for mercury, nickel and selenium were based on the surrogate chemicals, cadmium, copper, and zinc (Section 4.5.2). Future risk assessments should use the available bioaccumulation factors for all chemicals. These can be obtained from the Oak Ridge National Laboratory website.

9. TOXICITY CRITERIA. The low toxicity reference value for mammals (Table A-1) has been changed from 0.0015 mg/(kg x day) to 1 mg/(kg x day) [<http://www.dtsc.ca.gov>].

10. UNCERTAINTY ASSESSMENT.

- A. Section 4.7.1 states that "*The distinction between background and site data is somewhat unclear, and several COPCs may be present only at naturally occurring concentrations.*" Table 3-3 demonstrates obvious distinctions between background and site data (General Comment 1). Inappropriate pooling of the site data blurs the distinctions.
- B. In presenting comparisons to the Kearney Foundation study of California soils, Section 4.7.1 states that "*For example, the minimum, maximum and mean values for lead for the site (0.28, 15.7, and 4.7 mg/kg, respectively) seem consistent with the same values taken from representative soils (12.4, 97.1, and 23.9 mg/kg).*" First, the values cited for the ATON study are based on inappropriate pooling (General Comment 1). Second, it is unclear in what way 0.28, 15.7, and 4.7 mg/kg are consistent with 12.4, 97.1, and 23.9 mg/kg.

GENERAL COMMENTS ON HUMAN HEALTH RISK ASSESSMENT

11. RECEPTORS. Four types of human receptors (current and future researchers, current and future park rangers, current and future park visitors, current and future trespassers) are considered (Section 5.4.1). Given the isolation of the area and its status as part of a National Park, we concur that these categories are appropriate. We concur that evaluation of current and future researchers and current and future park rangers is protective of current and future park visitors and current and future trespassers, because of relative times of exposure. This will not necessarily apply to all of the Channel Island ATON sites.
12. EXPOSURE PARAMETERS.
- A. The exposure assessment (Section 5.4.3) "*...relies heavily on professional judgment and discussions with the San Miguel Park Ranger.*" This is appropriate.
 - B. For the park ranger, the proposed exposure frequency is 172 days per year, the proposed exposure duration is 25 years, and the fraction of soil ingested from the contaminated source is 0.5. Section 5.4.3 explains exposure frequency with the statement that "*This value is based on a 7-day work week with every other week spent on the island and 10 vacation days per year.*" This suggests 25 weeks of seven days per week for a total of 175 days, rather than 172 days. This is a minor difference.
 - C. For the park ranger, the proposed fraction from the contaminated source is 0.5. Section 5.4.3 explains that this is equivalent to spending every other day at the ATON site. That is, the exposure frequency becomes 86 days per year. This is approximately one third of the park ranger's work time. Given the small size of the ATON site, this is a reasonable upper bound estimate.
 - D. The proposed skin surface areas (Section 5.4.3) are 5700 cm² for the research scientist and 3300 cm² for the park ranger. We recommend 5700 cm² for both categories. First, National Park ranger do wear shorts as well as long pants. Second, clothing does not prevent dust from reaching the skin. Section 5.2 notes that there are high winds on San Miguel. Our experience during our 1999 visit was that winds and dust were typical of the Channel Island ATON sites. We found ourselves coated with dirt, including under clothing.
 - E. There is a discrepancy between Section 5.4.3, Table 5-1, and Attachment 7 for the adherence factor for the park ranger. We recommend the value of 0.7 (Section 5.4.3), rather than 0.2 (Table 5-1 and Attachment 7). Our rationale is the typical winds and dust conditions found at the ATON sites (see General Comment 10D).

- F. The inhalation rate for both the research scientist and the park ranger is given as 20 m³/day. This should be 20 m³ for an eight-hour work day, not for a full 24-hour day.
- G. Some of these exposure parameters, particularly those that rely on professional judgment, may not be appropriate for other ATON sites.

13. PRELIMINARY REMEDIATION GOALS.

- A. DTSC has agreed to the use of preliminary remediation goals (PRGs) for screening at military sites (DTSC, 1994). Although the U.S. Coast Guard is not part of the Department of Defense, this project is being administered under the DTSC Office of Military Facilities. Therefore, it was agreed that PRGs could be used for screening these ATON sites.
- B. DTSC (1994) does not allow for adjustments of PRGs or for the derivation of alternative PRGs at any military facility sites. Instead of the "*Adjusted Industrial Soil*" PRGs (Table 5-5). The appropriate way to address cumulative risk is to sum the hazard quotients for chemicals with the same toxic endpoint.
- C. The use of site-specific PRGs (Section 5.6.2) should be replaced with a forward risk assessment.

SPECIFIC COMMENTS

1. Acronyms, pages v-vi. The list of abbreviations (titled "*Acronyms*") needs editing. First, it is incomplete, lacking important terms (e.g., BAF, LOAEL). Second, it has at least one significant error (TRVs are defined as "*toxicity reference values*").
2. Page 2-2, paragraph 3. Nickel should be added to the list of inorganic chemicals.
3. Page 3-4, paragraph 1. The third sentence should be revised by splitting it into two sentences.
4. Tables 3-1, 3-2a, 3-3, Figure 3-1. For clarity, please use a consistent terminology. Tables 3-1 and 3-2a refer to "*Erosion channel from ATON to beach*". Table 3-3 refers to "*Main drainage area*". Figure 3-1 refers to "*Main Arroyo*". Each of these refers to the same area.
5. Sample 039-DTS. Table 3-2b and Sections 3.4.4 and 3.4.5 state that this sample was "*located approximately 60 feet east of the eyebolt area*". However, Figure 3-1 shows its location as about 120 feet south of the eyebolt.
6. Page 3-13, last paragraph. Please change "*Several reported results...*" to "*Almost all results...*" for accuracy.

7. Section 3.5.2. Please add a comment on the problem with field blanks (Section 3.3.4) to this discussion of Data Quality.
8. Section 3.6. The text states that "*For nondetects, COPCs are assumed to be present at one-half of the laboratory reporting limit, if one-half the detection limit is less than the maximum reported detected value.*" Please state what was done in the alternative case.
9. Page 3-16, paragraph 1; Table 3-7. The maximum concentration is used **instead of the 95% upper confidence limit**, not **as the 95% upper confidence limit**.
10. Page 4-2, paragraph 2. Please clarify what is meant by "*...the initial absence of residual soil data*".
11. Page 4-10, last paragraph. The text states that "*Although much of the battery pieces have been removed from the site, there is still the potential for residual contamination in site soils*". This may incorrectly suggest to the reader that few battery pieces remain. Section 2.3 reports that 2100 pounds of battery debris and eight whole batteries were removed in 1997. Nonetheless, our 1999 site visit found that battery fragments were not uncommon on the slope below the ATON location.
12. Page 4-16, paragraph 4. The text states that "*Only those COPCs that have been measured at concentrations exceeding background are evaluated using food chain modeling*". This may be misleading, because it in fact applies to every chemical analyzed, except antimony.
13. Page 4-23, paragraph 3. The reference should be to Attachment 5, not Attachment 3. Furthermore, the tables are labeled A-1 through A-10, not 1 through 10.
14. Section 4.7.3. The uncertainty discussion should note that the Site Foraging Factor has a very large impact on the dose estimates for red-tailed hawk and the island fox. The Site Foraging Factor for the island fox is based on information about the red fox, which may have a significantly larger foraging area than the island fox. The uncertainty discussion should also acknowledge that the four representative species are surrogates and as such may underestimate potential risks to some species of the species they are intended to represent.
15. Attachment 5 tables. These tables provide important information about exposure parameters, yet they are extremely difficult to read because of the font size.
16. Figure 5-1 is missing.
17. Section 5.4.1, paragraph 1. The text states that "*...casings of many of the primary batteries were ruptured.*" However, Section 2.3 reports that 2100 pounds of battery debris and eight whole batteries were removed in 1997. This suggests that **most** of the batteries were ruptured.

18. Page 5-28, paragraph 1. The text cites "...the UCL calculations in Table 5-3." Table 5-3 has only toxicity criteria.

CONCLUSIONS AND RECOMMENDATIONS

1. One objective of this document is to establish risk assessment methods for use at other ATON sites in the Channel Islands. We have directed our comments toward that objective.
2. The sample data appear to come from at least five different populations (the background area, the ATON area, the main arroyo, the cross channel, and the beach). Pooling the "site" data to generate exposure point concentrations is unwarranted. Statistics based on pooled "site" data are not meaningful.
3. The inorganic concentrations in the ATON area and the main arroyo are elevated compared to the background concentrations and compared to the cross channel and the beach concentrations. This could be consistent with contamination from the batteries. Whether or not there is actual contamination, the concentrations are modest, as seen in the following table.

MAXIMUM CONCENTRATIONS (mg/kg)								
Antimony	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Zinc
1.1	10.5	0.6	25.9	15.7	0.1	32.2	2.2	109

4. We do not recommend any revisions of this document. Instead, we recommend that these comments serve to document issues for use in improving future risk assessments.
5. We recommend no further evaluation and no remedial action for the San Miguel ATON.
6. We recommend that if concentrations at other ATON site are comparable to these, the team should discuss data evaluation and risk assessment needs before producing a document.

REFERENCES

Department of Toxic Substances Control, 2003. Memorandum from B. K. Davis to T. Mahmoud regarding the RCRA Facility Investigation Report. April 21, 2003.

Department of Toxic Substances Control, Office of Scientific Affairs, 1994. Recommended Outline for Using U.S. Environmental Protection Agency Region IX Preliminary Remedial Goals in Screening Risk Assessments at Military Facilities.

Tayseer Mahmoud
Page 10
March 15, 2004

Memorandum from Michael J. Wade, Laura Valoppi and John Christopher to Kenneth Smith, dated October 28, 1994.

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